TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No. R.303095

In Re Application Of: **Norbert BREUER et al.**

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10/520,109	January 3, 2005	D. Tran	02119	3748	9548

Invention: **Device and method for purification of exhaust gas in an internal combustion engine**

COMMISSIONER FOR PATENTS:

Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed on:
September 21, 2007

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Dated: **November 19, 2007**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re patent application of

Norbert BREUER et al. Before the Board of Appeals

Serial No. 10/520,109 Art Unit: 3748

Filed: January 3, 2005 Examiner: D. Tran

For: Device and method for purification of exhaust gas in an internal combustion engine

APPELLANT'S BRIEF (37 CFR 41.37)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date: November 19, 2007

Sir:

This Brief is filed in support of the Notice of Appeal filed on September 21, 2007.

The fee for this Appeal Brief of $510 should be charged to Deposit Account No. 07-2100 by the attached deposit account form, submitted in duplicate.

11/20/2007 MAHMED1 00000033 072100 10520109
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I - REAL PARTY IN INTEREST

The real party in interest in this appeal is:

Robert Bosch GmbH

Zentrale Patentabteilung

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II - RELATED APPEALS AND INTERFERENCES

With respect to other appeals or interferences that will directly affect, or be directly affected by, or have a bearing on the Board's decision in this appeal, there are no such appeals or interferences. None

III - STATUS OF CLAIMS

A. TOTAL NUMBER OF CLAIMS IN APPLICATION - Twenty (20)

Claims in the application are: 20-22, 24-29 and 31-41.

B. STATUS OF ALL THE CLAIMS

1. Claims canceled: 1-19, 23 and 30.
2. Claims withdrawn from consideration but not canceled: None.
3. Claims pending: 20-22, 24-29 and 31-41.
4. Claims allowed: None.
5. Claims rejected: 20-22, 24-29 and 31-41.

C. CLAIMS ON APPEAL

The claims on appeal are: 20-22, 24-29 and 31-41.

IV - STATUS OF AMENDMENTS

An amendment was filed on August 20, 2007, subsequent to the final rejection. No changes to the claims were made in the amendment. An Advisory Action was mailed on September 10, 2007, indicating that the amendment would be entered for purposes of appeal.

V - SUMMARY OF CLAIMED SUBJECT MATTER

In the following summary, all references to pages and lines can be found in the original English-language specification filed on January 3, 2005. However, it should be noted that the original English-language specification contained a number of minor errors that were corrected by the preliminary amendment also filed on January 3, 2005.

Independent claim 20 is directed to

a method for purifying the exhaust gas stream in the exhaust gas line (7) of an internal combustion engine (1), of particles such as soot, the exhaust gas stream being enriched with ozone (p. 1, ll. 4, 5; p. 3, l. 23 - p. 4, l. 2), the method comprising the steps of

effecting a continuous enrichment of the exhaust gas stream with ozone such that particles that are present are to a great extent oxidized during the flow through the exhaust gas line (7) (p. 13, ll. 1-9),

measuring at least one of the temperature of the exhaust gas and the particle content of the exhaust gas downstream of the enriching (p. 4, ll. 3-19; p. 8, ll. 6-16), and

controlling the concentration of the ozone essentially as a function of at least one of the temperature and the particle content of the exhaust gas, such that the remaining particle content of the exhaust gas stream does not exceed a predetermined limit value (p. 9, ll. 1-12; p. 13, l. 11 - p. 14, l. 5).

VI - GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 20-22, 31-39 and 41 stand rejected under 35 U.S.C. 103(a) as unpatentable over Birckigt et al (WO 02/42615) in view of Caren et al (US 6,321,531).

Claims 24-29 and 40 stand rejected under 35 U.S.C. 103(a) as unpatentable over Birckigt et al in view of Caren et al and Rohde et al (US 3,771,921).

VII - ARGUMENTS

A. The 35 U.S.C. 103(a) rejection of claims 20-22, 31-39 and 41

It is noted that, in the final rejection, the statement of the rejection refers to 35 U.S.C. 102(a), but the body of the rejection makes it clear that the rejection is actually under 35 U.S.C. 103.

The examiner uses Birckigt et al (US 6,938,409), the English language equivalent of Birckigt et al (WO 02/42615), for an understanding of Birckigt et al (WO 02/42615). The appellants have done the same. Thus, in the following discussion of the Birckigt reference, the references to claims or columns and lines can be found in Birckigt et al (US 6,938,409).

Birckigt teaches a method for reducing carbon-containing particle emissions from a diesel engine, comprising: routing exhaust gas emitted by the diesel engine through a filter; separating out particles contained in the exhaust gas at filter surfaces; and oxidizing the particles which have been separated out for regeneration of the filter initiated by non-thermal, electric surface creeping discharges selectively generated at the filter surfaces occupied by the particles. See, claim 1. Oxidizing is initiated by electrical excitation for the surface creeping discharge by one of an alternating voltage and a periodic pulse voltage. See, col. 4, ll. 18-25 and claim 5. In the embodiment illustrated in Fig. 13, Birckigt teaches controlling the amplitude and frequency/pulse repetition rate as a function of pressure and/or temperature of the exhaust gases. See, col. 8, ll. 10-38.

Caren et al describes the use of a corona discharge device to produce free radials to reduce pollutants in an exhaust gas stream. See, col. 11, l. 45 - col. 12, l. 65.

In contrast, applicants' claims are directed to a method that enriches the exhaust gas with ozone and the ozone concentration is controlled as a function of the temperature and/or the particle content downstream of the enriching. Birckigt et al is definitely not able to control an ozone concentration. The only thing that can be controlled in Birckigt et al is the power for generation of a plasma; ozone is not mentioned in Birckigt et al. Caren et al uses a corona discharge, which is known to produce only a limited amount of ozone. Caren et al actually teaches that what is produced is a cocktail of free radials. Caren et al provides no teaching or suggestion of controlling an ozone concentration.

To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Neither Birckigt et al nor Caren et al teaches or suggests a method of the type recited in claim 20, including the step of controlling the concentration of ozone in an exhaust gas stream essentially as a function of at least one of the temperature and the particle content of the exhaust gas, such that the remaining particle content of the exhaust gas stream does not exceed a predetermined limit value. Accordingly, claim 20 and the claims dependent thereon are not rendered obvious by the combined teachings of Birckigt et al and Caren et al.

Further, in order to establish prima facie obviousness of a claimed invention, there must be an apparent reason to combine the teachings of the various references. This analysis should be made explicit. In re Kahn, 441 F. 3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal

conclusion of obviousness").

In the rejection of claims 20-22, 31-39 and 41, the examiner has failed to articulate any reasoning accompanied by rational underpinning to support the legal conclusion of obviousness. In this regard, it is pointed out that the teachings of Caren et al are not relevant to either the method or structure disclosed in Birckigt et al.

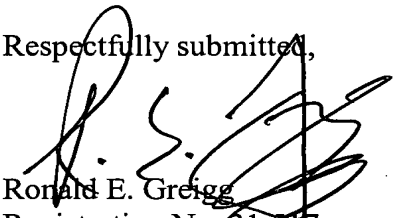
B. The 35 U.S.C. 103(a) rejection of claims 24-29 and 40

Rohde et al describes the continuation of air flow through a catalytic converter after engine shut down. The examiner's finding on page 4 of the final rejection that Rohde et al teaches introducing **ozone** into the exhaust gas line is simply wrong. Rohde et al actually describes the addition of **air** after engine shut down, which obviously has nothing to do with any usage of ozone or the control of ozone concentration in the exhaust gas line. Therefore, Rohde et al does not solve the basic deficiencies of the Birckigt-Caren combination previously pointed out.

Conclusion

For the reasons stated above, the appellants request that the Examiner's rejections of the claims be reversed.

Respectfully submitted,



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VIII - CLAIMS APPENDIX

20. A method for purifying the exhaust gas stream in the exhaust gas line (7) of an internal combustion engine (1), of particles such as soot, the exhaust gas stream being enriched with ozone, the method comprising the steps of effecting a continuous enrichment of the exhaust gas stream with ozone such that particles that are present are to a great extent oxidized during the flow through the exhaust gas line (7), measuring at least one of the temperature of the exhaust gas and the particle content of the exhaust gas downstream of the enriching, and controlling the concentration of the ozone essentially as a function of at least one of the temperature and the particle content of the exhaust gas, such that the remaining particle content of the exhaust gas stream does not exceed a predetermined limit value.

21. The method of claim 20, wherein oxygen present in at least one of the exhaust gas stream and water is used for the ozone enrichment.

22. The method of claim 20, further comprising the steps of generating the ozone in a reaction chamber (16) outside the exhaust gas stream.

24. The method of claim 40, further comprising the step of increasing the ozone concentration on or in the particle filter (3) until the self-ignition of the deposited particles.

25. The method of claim 40, comprising the further step of utilizing of a blower (17) to generate an ozone-enriched gas flow through the particle filter (3).

26. The method of claim 24, comprising the further step of utilizing of a blower (17) to generate an ozone-enriched gas flow through the particle filter (3).

27. The method of claim 40, comprising the further step of regulating the ozone delivery on the basis of the temperature of the particle filter (3).

28. The method of claim 24, comprising the further step of regulating the ozone delivery on the basis of the temperature of the particle filter (3).

29. The method of claim 25, comprising the further step of regulating the ozone delivery on the basis of the temperature of the particle filter (3).

31. The method of claim 41, wherein the gas stream is introduced into the exhaust gas line (7) upstream of an oxidizing catalytic converter (2) whereby at least the oxidizing catalytic converter (2) is rinsed with the ozone-enriched gas before the engine (1) is started.

32. The method of claim 31, further comprising controlling the combustion in the engine immediately after the engine (1) is started, such that the exhaust gases still contain combustible hydrocarbons.

33. The method of claim 41, further comprising effecting an enrichment, in particular a digressive enrichment, of the exhaust gas stream with ozone generated by the ozone source (5) until the operating temperature of the oxidizing catalytic converter (2) is reached.

34. The method of claim 31, further comprising effecting an enrichment, in particular a digressive enrichment, of the exhaust gas stream with ozone generated by the ozone source (5) until the operating temperature of the oxidizing catalytic converter (2) is reached.

35. The method of claim 32, further comprising effecting an enrichment, in particular a digressive enrichment, of the exhaust gas stream with ozone generated by the ozone source (5) until the operating temperature of the oxidizing catalytic converter (2) is reached.

36. The method of claim 41, wherein the internal combustion engine is a Diesel engine and the rinsing with ozone-enriched gas is effected during the pre-glow phase of the Diesel engine.

37. The method of claim 31, wherein the internal combustion engine is a Diesel engine and the rinsing with ozone-enriched gas is effected during the pre-glow phase of the Diesel engine.

38. The method of claim 32, wherein the internal combustion engine is a Diesel engine and the rinsing with ozone-enriched gas is effected during the pre-glow phase of the Diesel engine.

39. A motor vehicle having an internal combustion engine, in particular a Diesel engine, having a control unit (6) for controlling at least the combustion process of the engine (1), with a computation device, in particular a microprocessor, for performing a method of claim 20.

40. The method of claim 20, wherein after the internal combustion engine has been shut off, ozone is generated in an ozone source and is introduced into the exhaust gas line (7) in the region of a particle filter (3) arranged in the exhaust gas line (7), so that the particle filter can be regenerated.

41. The method of claim 20, wherein an ozone-enriched gas stream is generated in an ozone source (5), and the exhaust gas line (7) is at least partially flushed with the ozone-enriched gas stream before the internal combustion engine (1) is started.

IX - EVIDENCE APPENDIX

None

X - RELATED PROCEEDINGS APPENDIX

None